

# Optimal control problem for the three-sector economic model of a cluster

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**Abstract:** Problems of optimal control for dynamic systems with fixed ends of trajectories are often used in practical applications. Various mathematical formulations of optimal control problems and their classification are given in [1].

In this work the problem of optimal control for the three-sector economic model of a cluster is considered [2]. Problem statement is to determine the optimal distribution of investment and manpower in moving the system from a given initial state to desired final state. To solve the optimal control problem with finite-horizon planning, in case of fixed ends of trajectories, with box constraints, method of Lagrange multipliers of a special type is used [3]. This approach allows to represent the desired control in the form of synthesis control, depending on state of the system and current time. The results of numerical calculations for a three-sector economic model show the effectiveness of the proposed method.

**Keywords:** Economic model, cluster, investments, manpower, optimal control problem, method of Lagrange multipliers

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